Complete Summary

GUIDELINE TITLE

Assessment and management of acute pain.

BIBLIOGRAPHIC SOURCE(S)

Institute for Clinical Systems Improvement (ICSI). Assessment and management of acute pain. Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2006 Mar. 68 p. [118 references]

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Assessment and management of acute pain. Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2004 Mar. 66 p.

** REGULATORY ALERT **

FDA WARNING/REGULATORY ALERT

Note from the National Guideline Clearinghouse: This guideline references drugs for which important revised regulatory information has been released:

- On April 7, 2005, the U.S. Food and Drug Administration (FDA) asked manufacturers of non-prescription (over the counter [OTC]) non-steroidal anti-inflammatory drugs (NSAIDs) to revise their labeling to include more specific information about potential gastrointestinal (GI) and cardiovascular (CV) risks, and information to assist consumers in the safe use of the drugs. See the FDA Web site for more information.

  Subsequently, on June 15, 2005, the FDA requested that sponsors of all NSAIDs make labeling changes to their products. FDA recommended proposed labeling for both the prescription and OTC NSAIDs and a medication guide for the entire class of prescription products. See the FDA Web site for more information.

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Acute pain, including:

- Visceral pain
- Somatic pain
- Neuropathic pain

GUIDELINE CATEGORY

Evaluation
Management
Prevention

CLINICAL SPECIALTY

Anesthesiology
Emergency Medicine
Family Practice
Internal Medicine
Pediatrics

INTENDED USERS

Advanced Practice Nurses
Allied Health Personnel
Health Care Providers
Health Plans
Hospitals
Managed Care Organizations
Nurses
Physician Assistants
Physicians

GUIDELINE OBJECTIVE(S)

- To improve pain management through assessment of all patients throughout hospitalization including on admission, during hospital stay, and at discharge or during an outpatient visit

- To improve the appropriate selection and dosing of pain management treatment
- To increase the involvement of patients in pain management

TARGET POPULATION

Patients of all ages (from infants to the very elderly) who have acute pain or may be experiencing acute pain in the future (e.g., planned surgery)

Note: This guideline excludes patients with acute cancer pain, labor pain, and migraine headache although many of the guideline's recommendations apply to those groups as well.

INTERVENTIONS AND PRACTICES CONSIDERED

Evaluation

1. Detailed history and physical examination to determine mechanism of pain (somatic, visceral, or neuropathic)
2. Pain assessment tools for adults (Visual analog scale [VAS], Numeric rating scales [NRS], Verbal description scales [VDS], Facial pain scales [FPS], Brief Pain Inventory [BPI]; McGill Pain Questionnaire [MPQ], Brief Pain Inventory [BPB], McGill Pain Questionnaire [MPQ])
3. Pain assessment tools for children (Self-Report Measures, Poker Chip Tool, Faces Scale, Visual Analog Scale, Oucher Scale, Pain diary, Children's Hospital of Eastern Ontario Pain Scale [CHEOPS], CRIES [C-crying; R-requires oxygen; I-increased vital signs; E-expression; S-sleeplessness], Modified Behavior Pain Scale [MBPS], Postanesthetic Recovery Score, FLACC [face-legs-activity-cry-consolability], COMFORT scale, Wong-Baker Faces Pain Rating Scale, Coloured Analogue Scale, and Non-Communicating Children's Pain Checklist [NCCPC-R]; postoperative version [NCCPC-PV])
4. Diagnostic work-up as indicated

Treatment/Management/Prevention

1. Patient education (e.g., audio-visual information; pain coping strategies; medication management and side effects; perioperative education)
2. Topical therapies, such as cold and heat
3. Pharmacologic treatment
    - Intravenous agents: nonsteroidal anti-inflammatory drugs (NSAIDs); opioids, ketamine
    - Oral agents: anticonvulsants, antidepressants, antihistamines, anxiolytics, corticosteroids, hypnotics, local anesthetics, NSAIDs, opioids including tramadol
    - Rectal suppositories: Acetaminophen, NSAIDs, aspirin, opioids, phenothiazines
    - Topical agents: capsaicin, local anesthetics, eutectic mixture of local anesthetics (EMLA)
    - Subcutaneous agents: local anesthetics, opioids
    - Patient controlled analgesia (intravenous or subcutaneous)
4. Procedures such as neuraxial, regional, or sympathetic blocks
5. Adjuvant therapies

    - Alternative therapies (acupuncture, homeopathy, hypnosis, touch therapy, massage therapy)
    - Physical medicine and rehabilitation (gait aids, galvanic stimulation, physical therapy, support devices/garments, transcutaneous electrical nerve stimulation, ultrasound)
    - Psychological therapies (behavioral therapy, biofeedback, cognitive behavioral therapy, counseling, hypnosis, relaxation)
6. Behavioral/cognitive interventions (desensitization; positive reinforcement; relaxation; preparation; memory change; hypnosis; thought stopping and positive self-statements; distraction; modeling and rehearsal)
7. Specialty consult as indicated
8. Management of side effects of medications
9. Follow-up and reassessment

MAJOR OUTCOMES CONSIDERED

- Validity and reliability of pain assessment tools
- Pain relief
- Adverse effects of medications

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Additional descriptions of literature search strategies are not available.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Key conclusions (as determined by the work group) are supported by a conclusion grading worksheet that summarizes the important studies pertaining to the conclusion. Individual studies are classed according to the system presented below, and are designated as positive, negative, or neutral to reflect the study quality.

Conclusion Grades:

Grade I: The evidence consists of results from studies of strong design for answering the question addressed. The results are both clinically important and consistent with minor exceptions at most. The results are free of any significant doubts about generalizability, bias, and flaws in research design. Studies with negative results have sufficiently large samples to have adequate statistical power.

Grade II: The evidence consists of results from studies of strong design for answering the question addressed, but there is some uncertainty attached to the conclusion because of inconsistencies among the results from the studies or because of minor doubts about generalizability, bias, research design flaws, or adequacy of sample size. Alternatively, the evidence consists solely of results from weaker designs for the question addressed, but the results have been confirmed in separate studies and are consistent with minor exceptions at most.

Grade III: The evidence consists of results from studies of strong design for answering the question addressed, but there is substantial uncertainty attached to the conclusion because of inconsistencies among the results of different studies or because of serious doubts about generalizability, bias, design flaws, or adequacy of sample size. Alternatively, the evidence consists solely of results from a limited number of studies of weak design for answering the question addressed.

Grade Not Assignable: There is no evidence available that directly supports or refutes the conclusion.

Study Quality Designations:

The quality of the primary research reports and systematic reviews are designated in the following ways on the conclusion grading worksheets:

Positive: indicates that the report or review has clearly addressed issues of inclusion/exclusion, bias, generalizability, and data collection and analysis.

Negative: indicates that these issues (inclusion/exclusion, bias, generalizability, and data collection and analysis) have not been adequately addressed.

Neutral: indicates that the report or review is neither exceptionally strong nor exceptionally weak.

Not Applicable: indicates that the report is not a primary reference or a systematic review and therefore the quality has not been assessed.

Classes of Research Reports:

A. Primary Reports of New Data Collection:

Class A:

- Randomized, controlled trial

Class B:

- Cohort study

Class C:

- Non-randomized trial with concurrent or historical controls
- Case-control study
- Study of sensitivity and specificity of a diagnostic test
- Population-based descriptive study

Class D:

- Cross-sectional study
- Case series
- Case report

B. Reports that Synthesize or Reflect upon Collections of Primary Reports:

Class M:

- Meta-analysis
- Systematic review
- Decision analysis
- Cost-effectiveness analysis

Class R:

- Consensus statement
- Consensus report
- Narrative review

Class X:

- Medical opinion

METHODS USED TO ANALYZE THE EVIDENCE

Review of Published Meta-Analyses
Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not applicable

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Clinical Validation-Pilot Testing
Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Institute Partners: System-Wide Review

The guideline annotation, discussion and measurement specification documents undergo thorough review. Written comments are solicited from clinical, measurement, and management experts from within the member groups during an eight-week review period.

Each of the Institute's participating member groups determines its own process for distributing the guideline and obtaining feedback. Clinicians are asked to suggest modifications based on their understanding of the clinical literature coupled with their clinical expertise. Representatives from all departments involved in implementation and measurement review the guideline to determine its operational impact. Measurement specifications for selected measures are developed by the Institute for Clinical Systems Improvement (ICSI) in collaboration with participating member groups following implementation of the guideline. The specifications suggest approaches to operationalizing the measure.

Guideline Work Group

Following the completion of the review period, the guideline work group meets 1 to 2 times to review the input received. The original guideline is revised as necessary and a written response is prepared to address each of the responses received from member groups. Two members of the Committee on Evidence-Based Practice carefully review the input, the work group responses, and the revised draft of the guideline. They report to the entire committee their assessment of four questions: (1) Is there consensus among all ICSI member groups and hospitals on the content of the guideline document? (2) Has the drafting work group answered all criticisms reasonably from the member groups? (3) Within the knowledge of the appointed reviewer, is the evidence cited in the document current and not out-of-date? (4) Is the document sufficiently similar to the prior edition that a more thorough review (critical review) is not needed by the member group? The committee then either approves the guideline for release as submitted or negotiates changes with the work group representative present at the meeting.

Pilot Test

Member groups may introduce the guideline at pilot sites, providing training to the clinical staff and incorporating it into the organization's scheduling, computer and other practice systems. Evaluation and assessment occurs throughout the pilot test phase, which usually lasts for three to six months. At the end of the pilot test phase, ICSI staff and the leader of the work group conduct an interview with the member groups participating in the pilot test phase to review their experience and gather comments, suggestions, and implementation tools.

The guideline work group meets to review the pilot sites' experiences and makes the necessary revisions to the guideline; the Committee on Evidence-Based Practice reviews the revised guideline and approves it for release.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Note from the National Guideline Clearinghouse (NGC) and the Institute for Clinical Systems Improvement (ICSI): In addition to updating their clinical guidance, ICSI has developed a new format for all guidelines. Key additions and changes include: combination of the annotation and discussion section; the addition of "Key Points" at the beginning of most annotations; the inclusion of references supporting the recommendations; and a complete list of references in the Supporting Evidence section of the guideline. For a description of what has changed since the previous version of this guidance, refer to "Summary of Changes -- March - 2006."

The recommendations for the assessment and management of acute pain are presented in the form of two algorithms with 24 components, accompanied by detailed annotations. Algorithms are provided for: Assessment of Acute Pain and Acute Pain Treatment; clinical highlights and selected annotations (numbered to correspond with the algorithm) follow.

Class of evidence (A-D, M, R, X) ratings and key conclusion grades (I-III, Not Assignable) are defined at the end of the "Major Recommendations" field.

Clinical Highlights and Recommendations

- Determine the mechanism of pain (i.e., somatic, visceral, neuropathic) based on the physical examination and detailed history. (Annotation #8)
- Patients often experience more than one type of pain. (Annotation #8)
- Intensity of pain is assessed prior to initiation of appropriate treatment and continually reassessed throughout duration of treatment. (Annotation #3)
- Somatic pain is well-localized and may be responsive to acetaminophen, cold packs, corticosteroids, localized anesthetic (topical or infiltrate), nonsteroidal anti-inflammatory drugs (NSAIDs), opioids, and tactile stimulation. (Annotations #9, 12)
- Visceral pain is more generalized and is most responsive to opioid treatment. (Annotations #10, 13)

- Neuropathic pain may be resistant to opioid therapy and consideration should be given to adjuvant therapy such as tricyclic antidepressants and anticonvulsants. (Annotations #11, 14)

Assessment of Acute Pain Algorithm Annotations

1. Patient Has Pain or Is Likely to Have Pain

   Pain is undertreated by many practitioners, which leads to serious clinical consequences. This guideline encourages aggressive assessment, treatment and reassessment of pain.

   Evidence supporting this recommendation is of classes: B, D, R

2. Critical First Steps

   Key Points:

   - The patient and/or caregiver play a critical role in the assessment and management of pain.
   - Assessing the type and amount of pain is important to good pain control. This is done by describing and rating the pain. Educate the patient and/or caregiver in the selection and use of an appropriate pain scale.
   - Parents can help assess pain in children by what their child says, what their child is doing, and how their child's body is reacting.
   - Pain medications should not be withheld during initial evaluation for potential surgical abdomen.

   Acute pain is not a diagnosis, it is a symptom. Frequently its cause is obvious such as after surgery or an acute trauma. Many times, however, the exact underlying etiology is not clear and a diagnostic work-up is necessary. An interview with the patient or a responsible caregiver is essential to determine etiology. The interview and examination should cover the following:

   General History

   - History of present illness (HPI)
   - Current medications
   - Medication allergies
   - Past medical history
   - Social history

   Pain History

   - Onset
   - Duration
   - Quality, character
   - Ameliorating and provoking factors
   - Patient rating if possible (see Annotation #3)

Clinical Exam

- Observation of response to pain (pre-verbal or cognitively impaired patients): e.g., rubbing a particular area, guarding, facial expression
- Focused physical exam (part of body or region in pain), to include vital signs, especially pulse, respiratory rate, and blood pressure
- Functional assessment (see Annotation #3, "Pain Assessment" in the original guideline document). See the Support for Implementation section, Knowledge Products and Resources in the original guideline document, for examples of assessment tools on file at ICSI.
- Pain medications should not be withheld during initial evaluation for potential surgical abdomen.

Evidence supporting this recommendation is of classes: C, D, R

Further Diagnostic Work-up

Lab studies, x-rays or other diagnostic tests may be needed, depending on the results of the history and physical examination.

Specialty Consult

General surgical, orthopedic, anesthesiological or other consultation may be deemed necessary.

3. Pain Assessment

Key Points:

- The patient self report is the most reliable indicator of pain.
- The ideal pain assessment tool will facilitate identification of the presence of pain and be valid for use over time.
- The patient or caretaker should be taught how to use the pain scale.
- In children and the elderly, pain measures may be influenced by limited cognitive or language skills, or by the positive or negative consequences their pain reports or behavior produce.

Based on the assumption that patient self-reporting is the "most reliable indicator of the existence and intensity of pain" (National Institutes of Health), the ideal tool for pain will identify the presence of pain and its evolution over time. In addition, tools should be applicable to any person regardless of age, race, creed, socioeconomic status, and psychological or emotional background.

There are multiple pain assessment tools available for determining the quantity and quality of a patient's pain experience. Proper use of these tools mandates that the assessment occur at the time of presentation, throughout the course of the clinical encounter and after institution of therapy. In an acute care setting, pain intensity should be reassessed within 30 minutes for parenteral administration of medication and 60 minutes after oral therapy is begun. In an outpatient setting, patients should be instructed to contact their

care provider with feedback on the efficacy of the therapy prescribed. Dosing adjustments should be made on the basis of the patient's self-report, pattern of pain response to therapy and other clinical indicators available to the clinician for evaluation.

In the assessment of pain, the patient and/or caretakers should be actively involved. The patient or caretaker should be taught how to use the pain scale so they can self-report pain intensity or change in quality. Patients may need to understand that although complete relief is the ultimate goal, it is not always possible. They should determine for themselves what level of discomfort is acceptable and will allow for maximal function with activities of daily living.

The single dimensional scales measure only pain intensity and by their nature are self-report. These scales are reasonable for use in acute pain when the etiology is clear (i.e., trauma, pancreatitis, otitis media). The assessment tools in this classification were initially developed for research trials. One concern is that measuring intensity alone may be an oversimplification of the pain experience.

The multidimensional scales measure not only the intensity but also the nature and location of the pain and in some cases the impact the pain is having on activity or mood. These are excellent tools in the setting of persistent acute or chronic pain when intensity as well as social support, interference with activities of daily living (ADL) and relationship to depression may need to be assessed. Each of these was developed as a self-report but may be completed with the assistance of an interviewer or health care provider.

Refer to the original guideline document for Table 1, "Assessment Tools for Adults," and Table 2, "Assessment Tools for Children."

Evidence supporting this recommendation is of classes: A, B, C, D, R, X

4. Has Pain Persisted Greater Than 6 Weeks?

Chronic pain is not time dependent. However, if pain has persisted for 6 weeks (or longer than the anticipated healing time) patients should be thoroughly evaluated for the presence of chronic pain. See the NGC summary of the ICSI guideline Chronic Pain for more information.

8. Determine Mechanism of Pain Using History and Pain Assessment

Key Points:

- The physiology of pain guides the practitioner to more effectively and efficiently control pain.
- The clinician should be aware that the patient may experience a combination of pain types.

By identifying the type of pain, the provider can more efficiently treat pain by selecting the intervention most appropriate. The clinician should be aware the patient may experience a combination of pain types. See below for an assistive tool in determining mechanism of pain.

Evidence supporting this recommendation is of classes: D, R

Assistive Tool for Determining Type of Pain

	Type of Pain		
	Somatic Pain	Visceral Pain	Neuropathic P
Location	Localized	Generalized	Radiating or specific
Patient Description	Pin prick, or stabbing, or sharp	Ache, or pressure, or sharp	Burning, or prickling tingling, or electric s like, or lancinating
Mechanism of Pain	A-delta fiber activity. Located in the periphery*	C Fiber activity. Involved deeper innervation*	Dermatomal *** (peripheral), or non-dermatomal (central
Clinical Examples	• Superficial laceration • Superficial burns • Intramuscular injections, venous access • Otitis media • Stomatitis • Extensive abrasion	• Periosteum, joints, muscles • Colic and muscle spasm pain** • Sickle cell • Appendicitis • Kidney stone	• Trigem • Avulsi neuralgia • Post-t neuralgia • Periph neuropathy (human immunodefici virus [HIV]) • Limb amputation • Herpe neuralgia
Most Responsive Treatments	• Acetaminophen • Cold packs • Corticosteroids • Local anesthetic either topically or by infiltration • Non-steroidal anti-inflammatory drugs (NSAIDs) • Opioids • Tactile stimulation	• Corticosteroids • Intraspinal local anesthetic agents • NSAIDs • Opioid via any route	• Antico • Cortic • Neural blockade • NSAID • Opioid route • Tricycl antidepressar

*Most post-operative patients experience A-delta and C fiber pain and respond best to narcotic of any route and NSAIDs.

**Colic and muscle spasms may be less responsive to opioids. Respond best to antispasmodics, NSAIDs, benzodiazepines, baclofen.

***Segmental distribution follows a dermatome chart. This traces the pathway of sensation to its nerve root.

The algorithm acknowledges that in most clinical situations the initial treatment of pain and the diagnostic work-up occur concurrently. In other situations, e.g., central nervous system injury, it may be important to delay treating a patient's pain until the underlying diagnosis is established. These initial efforts to treat pain are based on the clinician's initial hypothesis of the etiology of the patient's pain.

See the clinical pearls section in Annotation #15, "Prevention/Intervention."

Treatment Algorithm Annotations

12. Somatic Pain Treatment

    Treatment of somatic pain includes the use of acetaminophen, cold packs, corticosteroids, localized anesthetic (topical or infiltrate), NSAIDs, opioids, and tactile stimulation.

    Evidence supporting this recommendation is of class: R

13. Visceral Pain Treatment

    Treatment choices for visceral pain include corticosteroids, intraspinal local anesthetic agents, NSAIDs, and opioids (via any route).

    Evidence supporting this recommendation is of class: R

14. Neuropathic Pain Treatment

    Neuropathic pain may be resistant to standard opioid therapies or other nociceptive pain treatment strategies. Anticonvulsants and tricyclic antidepressants are mainstays of therapy. Complaints of continuous burning may best respond to antidepressants, whereas lancinating complaints may best respond to anticonvulsants. The anticonvulsant gabapentin however, can treat both continued burning and episodic neuropathic pain. Failure to adequately relieve neuropathic pain with one anticonvulsant does not imply that alternative therapies will not work. Other potential treatments include local anesthetics (topical or intraspinal), tramadol, and glucocorticoids. Please refer to the original guideline document Appendix D, "Pharmacologic Treatment of Neuropathic Pain" for more information.

    Evidence supporting this recommendation is of class: R

15. Prevention/Intervention

    Key Points:

- Choices for intervention are varied and frequently involve multiple disciplines.
- Prior to a painful experience, the ability to cope and the outcome of pain treatment may be enhanced.
- The use of pharmacological agents is considered to be the mainstay of therapy for acute pain.

Medications and interventions are selected based on symptomatology and mechanism of pain. Choosing the profile that is the most responsive to the pain complaint and has the least potential for side effects should be done initially. Visceral, somatic and neuropathic pain complaints respond most effectively to different treatments. (See the table above). The route of administration often affects patient compliance and dosing requirements.

Patient Education

The ability to influence a patient's pain experience may be approached in multiple ways. Choices for intervention are varied and frequently involve multiple disciplines.

With proper education and training of patients (see "Key Patient Education Steps and Messages" below) prior to a painful experience, the ability to cope and the outcome of pain treatment may be enhanced.

See Table 3, "Acute Pain Interventions," in the original guideline document for summary of interventions.

Key Patient Education Steps and Messages

- Describe the expected type of pain and how long it will last. (Preparatory Sensory Information - decrease uncertainty and fear of unknown. "Knowledge is power.")
- Individualize the information for the patient.
- Discuss goals of pain management and how these goals help the patient: comfort, quicker recovery, and avoid complications.
- Preventing pain is important to manage pain well. "Stay ahead of the pain."
- Many drug and non-drug treatments can be helpful in preventing and managing pain.
- Inform the patient of when and how to contact health care providers about his/her pain.
- Patients, parents of children with pain, and the health care providers will decide as a team which treatments are best to manage the pain.
- Discuss treatment choices and plan, including schedule of medications, which are most appropriate for the patient.
- Addiction to opioids used in the treatment of acute pain is rare. There are differences among physical addiction, tolerance, and psychological dependence.

Review Safe Medication Use

Polices and procedures regarding safe medication use should be in place.

Pharmacological Therapy

The use of pharmacological agents is considered to be the mainstay of therapy for acute pain. There are three broad categories of medications to consider when treating the patient with acute pain: non-opioid analgesics (NSAIDs), opioid analgesics and analgesic adjuvants. They are used in this manner:

Non-opioid analgesics (NSAIDs and acetaminophen):

- Should be considered initially. Often adequate for mild or moderate pain.
- NSAIDs have significant opioid dose-sparing properties and in turn reduce opioid-related side effects.
- Use with caution in patients with coagulopathies or thrombocytopenia and those who are at risk for bleeding.
- Watch for gastrointestinal effects, especially with these risk factors: age greater than 60 years, previous gastrointestinal events and concomitant corticosteroid use.
- Ketorolac, either parenteral or oral, should be used for no more than 5 days; dose reduction is indicated in the elderly and in those with renal impairment. [Conclusion Grade III: See Conclusion Grading Worksheet A -- Annotation #15 (Ketorolac) in the original guideline document].
- See Appendix C, "Non-opioid Analgesics" in the original guideline document.

Before using NSAIDs, the hematological, gastrointestinal and renal effects should be taken into consideration. All but two NSAIDs, choline magnesium and salicylate, have been shown to inhibit platelet aggregation by inhibiting prostaglandin synthetase. Therefore, care must be used when prescribing NSAIDs in patients with coagulopathies or thrombocytopenia and in those who are at risk for bleeding.

Ketorolac, either parenteral or oral, should be used for no more than 5 days; dose reduction is indicated in the elderly and in those with renal impairment. [Conclusion Grade III: See Conclusion Grading Worksheet A -- Annotation # 15 (Ketorolac) in the original guideline document].

Evidence supporting these recommendations is of classes: A, B, C, D, R

Opioid Analgesics:

- If pain is not adequately controlled with an NSAID or is expected to be moderate to severe, an appropriate opioid should be added to the NSAID.
- In patients with absolute or strong relative contraindications to NSAIDs, an opioid for mild to moderate pain should be considered.
- Morphine is considered to be the standard opioid analgesic.

- Meperidine should be reserved for only very brief use (defined as less than 4 days) in the treatment of acute pain due to the risk of adverse central nervous system effects. [Conclusion Grade III: See Conclusion Grading Worksheet B -- Annotation #15 (Meperidine) in the original guideline document].
- See the original guideline document, Appendix B, "Opioid Analgesics," also "Recognizing Substance Abuse" in Annotation #15.

Ketamine

Ketamine is an anesthetic drug with analgesic properties. It is a potent N-methyl-D-aspartate (NMDA) antagonist. The NMDA receptor plays an important role in the development of central sensitization, described as hyperalgesia and the development of the "wind-up" phenomenon. Wind-up describes what is observed during repetitive noxious stimulation resulting in progressively increasing pain intensity. Ketamine may also prevent development of acute tolerance to opioids and opioid induced hyperalgesia. Thus, the ability of a drug to block this receptor is advantageous in acute pain control. However, when administered in high doses, ketamine has significant side effects which limit its usefulness. Hallucinations, paranoia, vivid dreams or delusions, delirium, and floating sensations may be experienced. Limiting the dose and providing a benzodiazepine may help limit these side effects.

The use of ketamine for acute pain control remains controversial. Human studies show mixed results in its ability to provide effective pain relief when used in combination with opioids. Low dose ketamine infusion has been found useful in limiting opioid requirements in patients undergoing major abdominal surgery. Low dose ketamine may be indicated in opioid resistant pain control in cancer patients who have preexisting opioid tolerance. Combining ketamine with morphine in patient-controlled analgesia (PCA) devices has not been proven to be efficacious.

Patient Controlled Analgesia (PCA)

Patient controlled analgesia (PCA) refers to the method where the patient self-administers analgesics, according to the clinician's order, to control his/her own pain. Most of the time, this refers to a programmable infusion pump that delivers an intravenous opioid to control pain, however, other methods and routes of delivery have been used, such as subcutaneous infusions.

PCAs usually consist of some continuous rate of opioid infusion (usually expressed as mg/hour) along with a patient-controlled demand (bolus) dose given at some frequency, with a lockout interval. Lockout interval refers to the time between boluses where the pump will not allow any more bolus doses to be administered.

The primary advantage of PCA therapy is the patient convenience since the patient controls when a dose of analgesic is given; the patient is not dependent upon a nurse to get a dose of analgesic. If appropriate doses of opioids are prescribed, the patient should not be at risk of respiratory depression because with repeated boluses, the patient falls asleep, avoiding

additional doses which might cause respiratory depression. The drawbacks of PCA include the increased expense of administering the medication because the pump and equipment are relatively expensive.

Safe dosing of opioids for PCA is very patient-dependent. Generally, lower doses are used for the elderly and opioid-naive patients, while equalanalgesic calculations should guide the prescriber for chronic opioid patients who now have acute pain. Opioid doses may be titrated based on analgesia and side effects.

When intravenous access is not possible, PCA may be administered via the subcutaneous route.

Inappropriate candidates for PCA therapy include those patients who are physically or cognitively unable to self-administer demand/breakthrough medication. In the treatment of acute pain, each institution should have guidelines delineating who may administer the demand dose, in order to safely provide analgesia.

Pharmacological analgesic adjuvants:

- Used to complement NSAIDs and opioids; not to be used alone in the treatment of acute pain. Gabapentin, however, can be used alone for treatment of neuropathic pain.
- Some have been shown to enhance the effect of a particular analgesic, such as caffeine when given with aspirin-like drugs; others have analgesic properties themselves, e.g., tricyclic antidepressants and hydroxyzine.
- See the section in Annotation #15, , "Prevention/Intervention", Pharmacological Therapy - Pharmacological Analgesics Adjuvants in the original guideline document for further discussion of medications used for adjuvant pain management.

Evidence supporting these recommendations is of classes: A, D, R

Specialty Consult (if indicated)

General surgical, orthopedic, anesthesiological or other consultation may be deemed necessary.

Intervention/Surgical Procedures

Procedures are used for both diagnostic and therapeutic effects and should be performed by experienced providers.

Preemptive Analgesia

Clinical studies have indicated that painful stimuli may produce changes in the spinal cord that in turn influence the response to further stimuli. The hypothesis of preemptive analgesia states that, by preventing the sensitization of the central nervous system which would normally amplify

subsequent nociceptive input, one may reduce the severity of postoperative pain. The neuroplastic response may be prevented by appropriate administration of analgesics before the stimulus in order to block painful nerve transmission. Thus, to be considered preemptive, the intervention must be given before the actual insult (e.g., surgical incision). A nerve conduction block is typically required, either by infiltration of local anesthetics near the site of expected injury, or by neuraxis blockade in the epidural or intrathecal spaces, also with local anesthetic. The use of neuraxial opioids may also play a role. Application of local anesthetics or opioids near the spinal cord is usually performed by an anesthesiologist. The N-methyl-D-aspartate (NMDA) receptor is also thought to play a key role in the development of central nervous system sensitization. Thus, the use of an NMDA antagonist may be helpful. However, results of studies evaluating the effects of preemptive analgesia have been mixed and have not shown definitive benefits.

Evidence supporting this recommendation is of classes: A, M

Adjuvant Therapy

Various strategies can enhance or complement pharmacologic interventions. These strategies can include behavioral/cognitive interventions such as education, distraction, relaxation, imagery, or physical modalities such as physical therapy/activity, acupuncture, vibration, massage, heat or cold.

Evidence supporting this recommendation is of class: R

Behavioral/Cognitive Intervention

Not all interventions are effective for all patients, and determining the best choice for the individual can be challenging.

In addition to behavioral and cognitive interventions detailed in Table #4 in the original guideline document, other approaches have included:

- Verbal preparation and communication with nurses and doctors.
- Sensorimotor strategies: especially with infants the use of pacifiers, swaddling, rocking and holding.
- Imaginative involvement: using imaginative stories or "pain switches" or "anesthetic gloves."
- Physical strategies: application of heat or cold, massage, immobilization, rest, or exercise.
- Music, art, and play therapies.

Evidence supporting this recommendation is of class: R

Clinical Pearls

Pediatric

- Circumcisions: The March 1999 Task Force Report from the American Academy of Pediatrics states, "If a decision for circumcision is made,

procedural analgesia should be provided. Dorsal Penile Nerve Block (DPNB), EMLA (Eutectic Mixture of Local Anesthetics), topical lidocaine, and ringblock have all been shown to be efficacious and safe but none completely eliminate the pain of circumcision."

- Percutaneous procedures: Eutectic mixture of local anesthetics (EMLA): Mixture of lidocaine and prilocaine applied under occlusive dressing (onset of action of 60-90 minutes) has been shown to be useful in venipuncture, intravenous access, circumcision and meatotomy. There have been concerns about methemoglobinemia which thus limits its use in neonates or infants. Recent studies in small populations demonstrate little toxicity.
- Intramuscular injections should be avoided if possible; most surveys indicate children would rather experience pain.

Evidence supporting this recommendation is of classes: A, R

Adults

- Acute ureteral colic: Parenteral NSAIDs are more effective than meperidine.
- "As needed" basis: For optimal treatment of acute pain, avoid the use of intramuscular injections ordered on an "as needed" basis. Acute pain medications should initially be titrated to effect and then given on a scheduled basis.
- Suturing non-end-artery sites: Use TAC (Tetracaine, Adrenaline, and Cocaine solution), or LET (Lidocaine, Epinephrine, and Tetracaine solution). See supporting references in the original guideline document for solution concentrations.
- Head injury and stroke: Avoid strong opioids to allow adequate patient assessment. Strong opioids may also decrease respiration rate, which may adversely affect (increase) intracranial pressure.
- Medication interaction: Oxycodone, Hydrocodone, Codeine and Tramadol may not be effective analgesics when given with other agents that strongly inhibit the Cytochrome P4502D6 liver enzymes. Common agents with this characteristic include the selective serotonin reuptake inhibitors Zoloft (doses greater than 150 mg), Paxil, and Prozac.
- Loading doses should be utilized for the management of acute pain once the underlying causes are known. See the original guideline document for more information on use of loading doses.
- Meperidine: In the treatment of acute pain, meperidine should be used only briefly and via a parenteral route.
- Propoxyphene is no more effective than acetaminophen in acute pain.
- "Road rash": NSAIDs (any route) or local anesthetic can be used.

Evidence supporting these recommendations is of classes: A, C, D, M, R

Refer to the original guideline document for more information on prevention/intervention.

22. Intolerable Symptoms Secondary to Treatment?

Key Points:

- Intolerable symptoms could be related to either the pain medication (particularly the opioid) or other causes.
- Patients should be given information about possible side effects and other symptoms that should be reported to nurse or provider.

Intolerable symptoms that could be related to either the pain medication (particularly the opioid) or other causes include:

- Decrease in mental status
- Confusion or delirium
- Nausea and vomiting
- Constipation or prolonged ileus
- Pruritus
- Urinary retention

The identification of pain through patient self report, or when that's not possible through a behavioral rating scale, will dictate the reduction of the opioid dosage or frequency. However, it should not be assumed that the opioid is always the cause.

The differential for decrease in mental status, confusion, or delirium is vast (see the original guideline document, Appendix E, "Side Effects"). Nausea and vomiting may be related to physiologic causes and other medication side effects, as well as pain medications. The cause should be determined. Appendix E, "Side Effects," in the original guideline document presents side effects of pain medications and their management.

Accurate documentation of bowel function should be done by the nurses in the postoperative setting. Constipation could be caused by immobility, all types of medications, metabolism dysfunction, etc. and is best treated from a prevention standpoint rather than after the patient complains. It is usually the belief that prolonged ileus is caused by postoperative opioids. Slowing of bowel function may be due to pain itself. The tendency in the surgical setting is to decrease or stop the opioid if an individual has prolonged ileus. If this is a strong opinion, then efforts need to be continued to control the individual's pain through other means, e.g., local anesthetics, or NSAIDs.

Patient should be given information about possible side effects and other symptoms that should be reported to nurse or provider.

23. Side Effect Management

See the original guideline document, Appendix E, "Side Effects."

Key patient education messages:

- Medications can cause side effects which can be managed or decreased.
- Side effects pertinent to medications and how to manage.

24. Follow-Up/Reassess

Reassessment should be continued at regular intervals, after any intervention, once a sufficient time has elapsed for the treatment to reach peak effect.

General guideline:

Parenteral medication -- 30 minutes

Oral medication -- 60 minutes

Non-pharmacologic intervention -- 30-60 minutes

The plan identifies the patient's continuing pain management needs and should be communicated to the patient with regards to appropriate follow-up.

Definitions:

Classes of Research Reports:

A. Primary Reports of New Data Collection:

Class A:

- Randomized, controlled trial

Class B:

- Cohort study

Class C:

- Non-randomized trial with concurrent or historical controls
- Case-control study
- Study of sensitivity and specificity of a diagnostic test
- Population-based descriptive study

Class D:

- Cross-sectional study
- Case series
- Case report

B. Reports that Synthesize or Reflect upon Collections of Primary Reports:

Class M:

- Meta-analysis
- Systematic review
- Decision analysis
- Cost-effectiveness analysis

Class R:

- Consensus statement
- Consensus report
- Narrative review

Class X:

- Medical opinion

Conclusion Grades:

Grade I: The evidence consists of results from studies of strong design for answering the question addressed. The results are both clinically important and consistent with minor exceptions at most. The results are free of any significant doubts about generalizability, bias, and flaws in research design. Studies with negative results have sufficiently large samples to have adequate statistical power.

Grade II: The evidence consists of results from studies of strong design for answering the question addressed, but there is some uncertainty attached to the conclusion because of inconsistencies among the results from the studies or because of minor doubts about generalizability, bias, research design flaws, or adequacy of sample size. Alternatively, the evidence consists solely of results from weaker designs for the question addressed, but the results have been confirmed in separate studies and are consistent with minor exceptions at most.

Grade III: The evidence consists of results from studies of strong design for answering the question addressed, but there is substantial uncertainty attached to the conclusion because of inconsistencies among the results of different studies or because of serious doubts about generalizability, bias, design flaws, or adequacy of sample size. Alternatively, the evidence consists solely of results from a limited number of studies of weak design for answering the question addressed.

Grade Not Assignable: There is no evidence available that directly supports or refutes the conclusion.

CLINICAL ALGORITHM(S)

A detailed and annotated clinical algorithm is provided for:

- Assessment of Acute Pain
- Acute Pain Treatment

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is classified for selected recommendations (see "Major Recommendations").

In addition, key conclusions contained in the Work Group's algorithm are supported by a grading worksheet that summarizes the important studies pertaining to the conclusion. The type and quality of the evidence supporting these key recommendations (i.e., choice among alternative therapeutic approaches) is graded for each study.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Appropriate medical evaluation and management of acute pain in adults and children resulting in pain relief, minimal medication side effects, and patient/clinician satisfaction

POTENTIAL HARMS

Refer to Appendices B, C, D, and E in the original guideline document for specific information on side effects and cautions concerning drug treatment of pain.

CONTRAINDICATIONS

CONTRAINDICATIONS

Neuraxial Blocks

Invasive blocks should be avoided in patients who are anticoagulated

Non-steroidal Anti-inflammatory Drugs (NSAIDs)

NSAIDs should be avoided or used with caution in patients with a history of gastrointestinal bleeding or renal insufficiency.

Opioid Analgesics

Tramadol is contraindicated in patients with hypersensitivity to the drug

Analgesic Adjuvants

- Tricyclic antidepressants (nortriptyline, desipramine, imipramine, amitriptyline, doxepin) use may be contraindicated in patients with conduction abnormalities, those taking anthracycline anti-tumor agents,

patients with narrow-angle glaucoma, urinary retention, 2nd and 3rd degree heart block, arrhythmia, hypersensitivity.
- Carbamazepine is contraindicated in patients with liver abnormalities, bone marrow suppression or known sensitivity to tricyclic compounds.
- Gabapentin is contraindicated for patients with renal insufficiency or demonstrated hypersensitivity to the drug or its ingredients.
- Phenytoin is contraindicated in patients with known sensitivity.
- Lidocaine patch 5% is contraindicated for patients with known sensitivity to local anesthetics of amide type.
- Mexiletine is contraindicated for patients with 2nd and 3rd degree heart block or arrhythmia.
- Duloxetine is contraindicated in patients who receive concomitant monoamine oxidase (MAO) inhibitors and those with uncontrolled narrow angle glaucoma.
- Pregabalin is contraindicated in patients with known sensitivity.
- Venlafaxine is contraindicated in patients who receive concomitant MAO inhibitors or have recently received MAO inhibitors, or those with known sensitivity.

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

- This clinical guideline should not be construed as medical advice or medical opinion related to any specific facts or circumstances. Patients are urged to consult a health care professional regarding their own situations and any specific medical questions they may have.
- These clinical guidelines are designed to assist clinicians by providing an analytical framework for the evaluation and treatment of patients, and are not intended either to replace a clinician's judgment or to establish a protocol for all patients with a particular condition. A guideline will rarely establish the only approach to a problem.
- The guideline authors acknowledge that assessments of pain in the pre-verbal, heavily medicated, ventilated, non-English speaking and cognitively impaired are challenging. At these times it is necessary to form clinical judgements regarding the patient's potential level of discomfort. Observer or caregiver ratings of pain and of the relief of pain with medical therapy are efficient in these clinical settings.
- Chemically dependent patients are undertreated with opioids when they have surgery. Nurses and doctors are typically unaware of the amount of medication it takes to actually achieve analgesia in a chemically dependent patient. When providers have to administer large doses of opioid to control pain, they may be afraid of causing respiratory depression and potentially enhancing the addiction.
- In 1980 a landmark report was published by Porter and Jick indicating that addiction is rare in patients treated with opioids for acute pain. Savage, 2002 emphasizes the need for proper assessment in these patients. Nevertheless there is an overwhelming concern about causing addiction in someone with acute pain. This overestimation of the risk of addiction originates from an inadequate understanding of the characteristics that define this syndrome and inappropriate extrapolation of information derived from the addict population.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

Once a guideline is approved for release, a member group can choose to concentrate on the implementation of that guideline. When four or more groups choose the same guideline to implement and they wish to collaborate with others, they may form an action group.

In the action group, each medical group sets specific goals they plan to achieve in improving patient care based on the particular guideline(s). Each medical group shares its experiences and supporting measurement results within the action group. This sharing facilitates a collaborative learning environment. Action group learnings are also documented and shared with interested medical groups within the collaborative.

Currently, action groups may focus on one guideline or a set of guidelines such as hypertension, lipid treatment and tobacco cessation.

Detailed measurement strategies are presented in the original guideline document to help close the gap between clinical practice and the guideline recommendations. Summaries of the measures are provided in the National Quality Measures Clearinghouse (NQMC).

Key Implementation Recommendations

The following system changes were identified by the guideline work group as key strategies for health care systems to incorporate in support of the implementation of this guideline.

1. All patients presenting with a complaint of acute pain are assessed for origin of pain through physical examination and detailed history.
2. An individualized care plan is developed for each patient to ensure adequate pain control while monitoring for signs of psychological and/or physical dependence.

IMPLEMENTATION TOOLS

Clinical Algorithm
Pocket Guide/Reference Cards
Quality Measures

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

RELATED NQMC MEASURES

- Assessment and management of acute pain: after 48 hours, the percentage of patients who rate pain greater than 4 (on a 10-point scale) or at an unacceptable level to patient.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Institute for Clinical Systems Improvement (ICSI). Assessment and management of acute pain. Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2006 Mar. 68 p. [118 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2000 Oct (revised 2006 Mar)

GUIDELINE DEVELOPER(S)

Institute for Clinical Systems Improvement - Private Nonprofit Organization

GUIDELINE DEVELOPER COMMENT

Organizations participating in the Institute for Clinical Systems Improvement (ICSI): Affiliated Community Medical Centers, Allina Medical Clinic, Altru Health System, Aspen Medical Group, Avera Health, CentraCare, Columbia Park Medical Group, Community-University Health Care Center, Dakota Clinic, ENT Specialty Care, Fairview Health Services, Family HealthServices Minnesota, Family Practice Medical Center, Gateway Family Health Clinic, Gillette Children's Specialty Healthcare, Grand Itasca Clinic and Hospital, HealthEast Care System, HealthPartners Central Minnesota Clinics, HealthPartners Medical Group and Clinics, Hutchinson Area Health Care, Hutchinson Medical Center, Lakeview Clinic, Mayo Clinic, Mercy Hospital and Health Care Center, MeritCare, Mille Lacs Health System, Minnesota Gastroenterology, Montevideo Clinic, North Clinic, North Memorial Care System, North Suburban Family Physicians, Northwest Family Physicians, Olmsted Medical Center, Park Nicollet Health Services, Pilot City Health Center, Quello Clinic, Ridgeview Medical Center, River Falls Medical Clinic, Saint Mary's/Duluth Clinic Health System, St. Paul Heart Clinic, Sioux Valley Hospitals and Health System, Southside Community Health Services, Stillwater Medical

Group, SuperiorHealth Medical Group, University of Minnesota Physicians, Winona Clinic, Ltd., Winona Health

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GUIDELINE COMMITTEE

Committee on Evidence-Based Practice

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

In the interest of full disclosure, Institute for Clinical Symptoms Improvement (ICSI) has adopted a policy of revealing relationships work group members have with companies that sell products or services that are relevant to this guideline topic. The reader should not assume that these financial interests will have an adverse impact on the content of the guideline, but they are noted here to fully inform readers. Readers of the guideline may assume that only work group members listed below have potential conflict of interest to disclose.

Diane Brundage, PharmD has significant financial interest in GlaxoSmith Kline, and has a spouse who receives consulting fees from Abbott Laboratories.

No other work group members have potential conflicts of interest to disclose.

ICSI's conflict of interest policy and procedures are available for review on ICSI's website at www.icsi.org.

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Assessment and management of acute pain. Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2004 Mar. 66 p.

GUIDELINE AVAILABILITY

Electronic copies: Available from the Institute for Clinical Systems Improvement (ICSI) Web site.

Print copies: Available from ICSI, 8009 34th Avenue South, Suite 1200, Bloomington, MN 55425; telephone, (952) 814-7060; fax, (952) 858-9675; Web site: www.icsi.org; e-mail: icsi.info@icsi.org.

AVAILABILITY OF COMPANION DOCUMENTS

The following are available:

- Assessment and management of acute pain. Executive summary. Bloomington (MN): Institute for Clinical Systems Improvement, 2006 Mar. 1 p. Electronic copies: Available from the Institute for Clinical Systems Improvement (ICSI) Web site.
- ICSI pocket guidelines. May 2005 edition. Bloomington (MN): Institute for Clinical Systems Improvement, 2005. 362 p.

Print copies: Available from ICSI, 8009 34th Avenue South, Suite 1200, Bloomington, MN 55425; telephone, (952) 814-7060; fax, (952) 858-9675; Web site: www.icsi.org; e-mail: icsi.info@icsi.org.

PATIENT RESOURCES

None available

NGC STATUS

This NGC summary was completed by ECRI on August 26, 2002. The information was verified by the guideline developer on September 23, 2002. This summary was updated by ECRI on March 14, 2003. The updated information was verified by the guideline developer on May 15, 2003. This summary was updated again by ECRI on July 28, 2004. This summary was updated by ECRI on January 12, 2005 following the release of a public health advisory from the U.S. Food and Drug Administration regarding the use of some non-steroidal anti-inflammatory drug products. This summary was updated on April 15, 2005 following the withdrawal of Bextra (valdecoxib) from the market and the release of heightened warnings for Celebrex (celecoxib) and other nonselective nonsteroidal anti-inflammatory drugs (NSAIDs). This summary was updated by ECRI on June 16, 2005, following the U.S. Food and Drug Administration advisory on COX-2 selective and non-

selective non-steroidal anti-inflammatory drugs (NSAIDs). This NGC summary was updated on May 10, 2006.

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